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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,526	12/13/2000	Kazuhito Hatoh	10059-368US	8925

570 7590 07/18/2002

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2005 MARKET STREET, SUITE 2200  
PHILADELPHIA, PA 19103

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 07/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/719,526

Applicant(s)

HATOH ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 1 is objected to because of the following informalities: in line 10, "an" should be "a." Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-132038 in view of JP 9-204924, in further view of WO 95/25357.

In the abstract and Figure 1, JP 6-132038 teaches a fuel cell stack comprising a unit cell composed of a polymer electrolyte membrane (2), catalyst layers (3, 4), and separator plates having gas passages (6, 7). Total heat exchangers (11, 21) for concurrently moving heating and humidity from discharged gases toward the incoming fuel and oxidant gases are present in the system (see paragraph [0018] of the machine translation).

JP 6-132038 does not expressly teach the presence of end plates on the fuel cell stack, or that the total heat exchangers are located inside the end plates (i.e., within the fuel cell stack).

The reference also does not expressly teach that the heat exchangers comprise polymer

electrolyte membranes which are the same as those in the unit cells, or the thicknesses of the membranes. Finally, the reference does not expressly teach the presence of current collector or insulating plates in the stack.

JP 9-204924 is directed to a solid polymer fuel cell stack having a humidification unit (11) contained within the endplates (16) of the stack (see abstract, Figure 10). The reference further teaches polymerized "dummy" (i.e., insulating) plates (15) in paragraph [0016] and Figure 10. The reference further teaches in paragraph [0013] that "the solid-state polyelectrolyte layer[s]" are used in the humidifiers.

WO 95/25357 is directed to a fuel cell stack comprising a humidification section. The stack comprises bus (i.e., current collector) plates (46, 48) at the edges of the active section (see Fig. 3).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of JP '924 to incorporate the total heat exchangers of JP '038 into (i.e., between the endplates of) the stack of JP '038. In paragraph [0018] of the machine translation, JP '924 teaches that "by uniting with the stack of a power generation area in the humidification area of a fuel cell, the gas humidifier of PEM type fuel cell of this invention can perform the above-mentioned humidification technique accurately, and it can attain miniaturization of a fuel cell while operation by which the fuel cell was stabilized can be performed." Accordingly, this disclosure would motivate the artisan to incorporate the total heat exchangers of JP '038 between the endplates of the stack of JP '038.

Furthermore, the artisan would be motivated to incorporate the dummy (insulating) plates of JP '924 into the fuel cell stack of JP '038 to prevent unwanted electrical contact of the fuel cells with the humidification units and/or endplates. Accordingly, this limitation is also not considered to distinguish over the references.

Regarding the limitation that the heat exchangers comprise polymer electrolyte membranes which are the same as those in the unit cells, as noted above, paragraph [0013] of JP '924 teaches that solid polymer electrolyte layers are used as water transport membranes in the heat exchangers. The artisan would be motivated to use these membranes in the heat exchangers of JP '038 because these membranes have good water-transport properties and are readily available to the artisan. Furthermore, the thickness of the membranes is a parameter that is recognized by the prior art as being a result-effective variable. The artisan would have motivation to make these membranes as thin as possible in order to reduce the diffusion distance of the water and to achieve a reduction in volume. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Finally, the artisan would be motivated to incorporate the current collector plates of WO 95/25357 into the fuel cell stack of JP '038 in order to facilitate the collection and withdrawal of electrical current in the stack. Accordingly, this limitation is also not considered to distinguish over the references.

*Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Patrick Ryan  
Supervisory Patent Examiner  
Technology Center 1700

JSC

July 11, 2002